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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,273	04/18/2006	Kimiaki Toshikiyo	P29772	9434
52123	7590	11/19/2009		
GREENBLUM & BERNSTEIN, P.L.C. 1950 ROLAND CLARKE PLACE RESTON, VA 20191			EXAMINER AHMED, SELIM U	
			ART UNIT 2826	PAPER NUMBER
			NOTIFICATION DATE 11/19/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gbpatent@gbpatent.com  
pto@gbpatent.com

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/576,273	TOSHIKIYO, KIMIAKI	
	<b>Examiner</b>	<b>Art Unit</b>	
	SELIM AHMED	2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 10 July 2009.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 11-16 and 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-16 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04/18/2008 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

### **DETAILED ACTION**

1. Applicant's response filed on 07/10/2009 is acknowledged. Applicants have amended claims 12-16, and 18; and canceled claims 1-11 and 17. The indicated allowability of claim 18 on non-final office action sent on 04/14/2009 is withdrawn in view of the newly discovered reference(s). Rejections based on the newly cited reference(s) follow.

### **ABSTRACT**

2. The abstract of the disclosure is objected to because it contains 2 paragraphs. Correction is required. See MPEP § 608.01(b).

### ***Drawings***

3. Figures 1-3 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al (US 2003/0071271; Suzuki hereinafter) in view of Tamechika et al (JP 2001-108812A; Tamechika hereinafter; Applicant's IDS reference submitted on 07/18/2006).

With regard to claim 11, Suzuki discloses solid-state imaging apparatus (e.g. Figs. 1, 2) comprising unit pixels (101, 102, 103, 104, 106, 107 form unit pixels) that are arranged in a two-dimensional array (e.g. Fig. 13), each unit pixel including a respective light-collector 107 and light-receiver 102, wherein said light-collector 102 includes: a substrate 101 onto which incident light is incident (the limitation "incident light is incident" found to be functional); above said substrate 101, a plurality of light transmitting films 107 (multiple 107 can be said as plurality of films which is in consistent with instant application's film 101) formed in a region (region where film 107 formed) onto which the incident light is incident ("incident light is incident" is a functional and redundant limitation); said plurality of light-transmitting films 107 forming a plurality of zones (zones of 107);

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wherein, for each unit pixel (101, 102, 103, 104, 106, 107 form unit pixel) located in a center of a plane (Fig. 3) on which said unit pixels (101, 102, 103, 104, 106, 107 form unit pixels) are formed, a central axis (Fig. 2) of said light-receiver 102 matches a central axis (Fig. 2) of said light collector 107 and wherein, for each unit pixel (101, 102, 103, 104, 106, 107 form unit pixel) located in a periphery (Fig. 2) of the center of the plane, a central axis of said light-receiver 102 and a central axis of said light-collector 107 extend toward the center of the plane (Fig.2; Furthermore, applicant's Figs. 1-3 admitted the limitations being conventional).

Suzuki explicitly fails to teach that the said plurality of light transmitting films forming a plurality of zones in which each zone is equal to or shorter than a wavelength of the incident light and said plurality of light transmitting films forming an effective refractive index distribution. However, It is common knowledge in the art to determine each zone of light transmissive film based on the desired wavelength to be detected because it permits control over particular wavelength detection thus, improving the overall quality. Furthermore, e.g. Figs. 2-4, para[0015, 0032, 0034] of Tamechika discloses the plurality of zones in which each zone is equal to or shorter than a wavelength of the incident light and said plurality of light transmitting films forming an effective refractive index distribution. According to abstract of the Tamechika, the purpose of the invention is to obtain an optical element with high diffracting efficiency which is small in the

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number of manufacturing steps, relatively easy to manufacture, and can be integrated. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use each zone that are equal to or shorter than a wavelength of incident light and plurality of light transmitting films forming an effective refractive index distribution within Suzuki's image sensor and results would have been predictable.

With regard to claim 13, e.g. Figs. 2-3 of Tamechika discloses the solid-state imaging apparatus according to Claim 12, wherein line widths (widths shown in Fig. 3(a)) of said light-transmitting films 5 are different between said light-collectors of said unit pixels located close to a zone center and said light-collectors of said unit pixels located near the zone periphery (e.g. Fig. 3(a)).

With regard to claim 14, Suzuki discloses the solid-state imaging apparatus (e.g. Fig. 12, 13) according to Claim 12, comprising at least: a first unit pixel (of 207a) for first color light (B) out of the incident light; and a second unit pixel 207E for second color light (G) which has a typical wavelength that is different from a typical wavelength of the first color light (Blue and green have different wavelength than Green). So, Suzuki discloses said first unit pixel includes a first light-collector, and said second unit pixel includes a second light-collector but does not explicitly disclose a focal length of the second color light is equal to a focal length of the first color light in said first light-collecting device

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although from Fig. 12 of Suzuki, one can reasonably assume that the focal lengths are equal. However, it is common knowledge in the art and would have been obvious to one having ordinary skill in the art at the time of the invention was made to optimize the imaging system such that a focal length of the second color light is equal to a focal length of the first color light in said first light-collecting device.

With regard to claim 15, e.g. Figs. 2-3 of Tamechika discloses the solid-state imaging apparatus according to Claim 12, wherein sums of the line widths of said light-transmitting films 5 in each of the divided areas are different between a light-collector of said unit pixel located in the center of the plane on which said unit pixel is formed and a light-collector of said unit pixel located in the periphery of the plane. Tamechika does not explicitly disclose light-collector of said unit pixel located in a center of a plane on which said unit pixel is formed and a light-collecting device of said unit pixel located in the periphery of the plane. However, as shown by Suzuki Figs. 1-6, it would have been obvious to one having ordinary skill in the art at the time of the invention to optimize the unit pixel's location (i.e. center or periphery in the plane) for making the imaging system more efficient.

With regard to claim 16, e.g. Figs. 2-3 of Tamechika discloses the solid-state imaging apparatus according to Claim 12, wherein a plane on which said pixels are formed is divided by concentric areas (e.g. Fig.3) from a center of the

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plane to the periphery (e.g. Fig.3). Tamechika does not explicitly disclose the focal lengths of said light-collectors of said unit pixels belonging to a same area are equal, and focal lengths of said light-collector of said unit pixels belonging to areas other than the same area are different. However, as shown by Suzuki Figs. 1-6, it would have been obvious to one having ordinary skill in the art at the time of the invention to optimize the focal length for more efficient imaging system.

5. Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki in view of Tamechika as applied to claim 11 and further in view of Itano et al (US 2004/0126934: Itano hereinafter).

With regard to claim 18, all of the claim limitations are rejected in claim 11 with the exception of each unit pixel further includes: a wiring layer having an aperture above a light-receiver on a light-outgoing side plane of said light-collector, and a focal point of light collected by said light-collector matches a central axis of the aperture of said wiring layer. It is noted from applicant's Fig.1 that the limitations are common knowledge as applicant admitted as conventional. Furthermore, e.g. Figs. 10, 11 of Itano discloses each unit pixel further includes: a wiring layer 12, 13 having an aperture (as shown in Figs. 10, 11) above a light-receiver (para[0035]), on a light-outgoing side plane of said light-collector (e.g. Fig. 10), and a focal point of light collected by said light-collector matches a position of the aperture of said wiring layer (e.g. Fig. 10). It



would have been obvious to one having ordinary skill in the art at the time of the invention to include the wire layer of Itano within Tamechika's device for interconnecting electrical signal and efficient imaging system.

### ***Response to Arguments***

6. Applicant's arguments with respect to claims 11-18 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to SELIM AHMED whose telephone number is (571)270-5025. The examiner can normally be reached on 9:00 AM-6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571)272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SA/

/Ben P Sandvik/  
Examiner, Art Unit 2826